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HUMAN ADAPTATIONS AND PLEISTOCENE ENVIRONMENTS IN SOUTH CHINA

ABSTRACT: Human adaptations and Pleistocene environments will be discussed in this paper. During the past two decades, there were several hundreds Palaeolithic localities found in South China. These provide more detailed information on the history of human evolution in this region. Pleistocene environments changed through space and time, but they were mainly dominated by tropical or sub-tropical forests except some temporal temperate grasslands in the northern part. Pebble-tool industries existed in river valleys of the eastern plain areas from the late Lower Pleistocene to early Upper Pleistocene. These were replaced by flake industries in the late Upper Pleistocene. Only flake industries were found in cave sites of Western mountain areas. From stone tool industries to settlement patterns, human adaptations in the tropics and sub-tropics of East Asia seem to be more complex than the Bamboo Hypothesis supposed.

KEY WORDS: South China – Human adaptation – Pleistocene environment – Palaeolithic – Human evolution

INTRODUCTION

Since modern Chinese archaeology began in the early 1920s, Palaeolithic excavations and research have been mainly carried out in North China. From the 1950s, Pleistocene human fossils were occasionally found by local people at limestone caves or at construction sites near the river banks, such as the Ziyang, Changyang and Maba hominid fossils (Wu, Olson 1985). The first important Palaeolithic site was excavated in South China at Guanyindong, a cave site in Guzhou Province, in the mid 1960s. Until the mid 1970s, there were only a few Palaeolithic sites found in caves of the limestone mountain areas in South China.

Contrasting the poor discoveries, many scholars have focused their research on East and Southeast Asia, including the huge area of South China, for a long time. As a result different hypotheses have been developed to explain the Palaeolithic remains of this region. The well-known Movius Line was set up during the 1940s, and still has influence even today (Movius 1944, 1948, Clark 1977, Klein 1989, Schick 1994). Since the late 1970s, some scholars began to emphasize the influence of particular environments in the tropical and subtropical Far East. They thought that bamboo and other wooden materials replaced the lithic tools in this region (Harrisson 1978, Pope 1989, Reynolds 1993).

However, just during the past twenty years, several hundred Palaeolithic localities have been found in South China, and the numbers are still increasing fast. In the meantime, researches of Quaternary geology and related disciplines also provide much more knowledge about Pleistocene environment and chronology. These developments bring more information about human evolution in the Far East. This paper will introduce some new Palaeolithic discoveries in South China, and discuss the human adaptations and Pleistocene environments of this region.

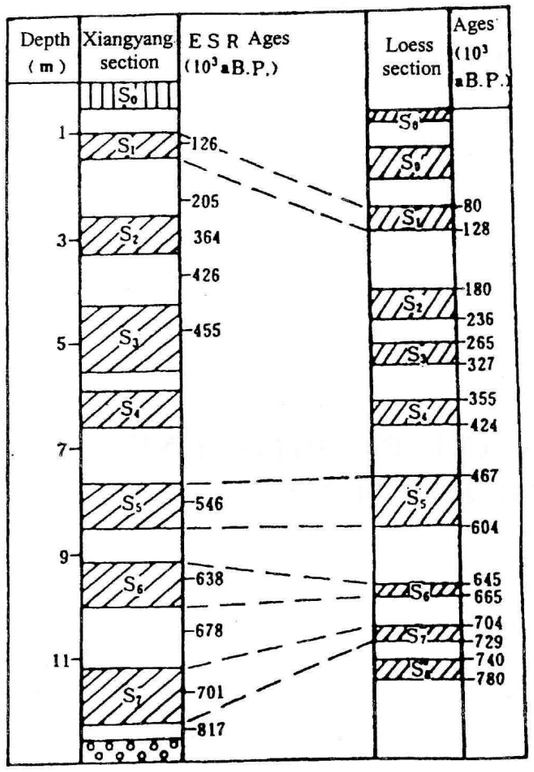


FIGURE 1. Xiangyang section and loess section (from Zhao, Yang 1995).

CHRONOLOGY AND ENVIRONMENT

The mainland of South China lies on the south-eastern part of the Asian continent, between approximately 20–33° N and 100–122° E. It encompasses the valleys of the middle and lower reaches of Changjiang river and its tributaries, the Jiangnanqiuling mountains and the valley of Zhujiang river in the East, the Yungui Plateau and Sichuan Basin in the West. The physical features vary from place to place, and there are many different local environments in South China. Archaeology has confirmed that Pleistocene hominids occupied this area for a long time.

Chronology

The date of the earliest occupation in South China is still controversial. This includes the discoveries at Yuanmou and Longgupo (Wu, Olson 1985, Huang *et al.* 1991, 1995). According to the biostratigraphic and magnetic stratigraphy, the date of the Longgupo hominid and artifacts is ca 1.9 to 1.7 myr, which would be the earliest occupation in China as well as in East Asia, but the majority of Palaeolithic and hominid fossils in South China are not older than 1 myr.

Recently the developments of Quaternary chronology research in South China, especially the multidisciplinary works associated with Palaeolithic archaeology, have established a basic chronological framework. An important contribution to Pleistocene chronology is the multidisciplinary research in the Xiangyang site, near Xuanzhou City, Anhui Province *(Figure 1)*. The stratigraphic section of Xiangyang includes 15 layers, which are dated to about 0.8 to 0.1 myr by the ESR method (Zhao, Yang 1995). Compared to the typical stratigraphic section of loess in Luochuan, Shaanxi Province of Northwest China, the age of the Xiangyang site is reasonable.

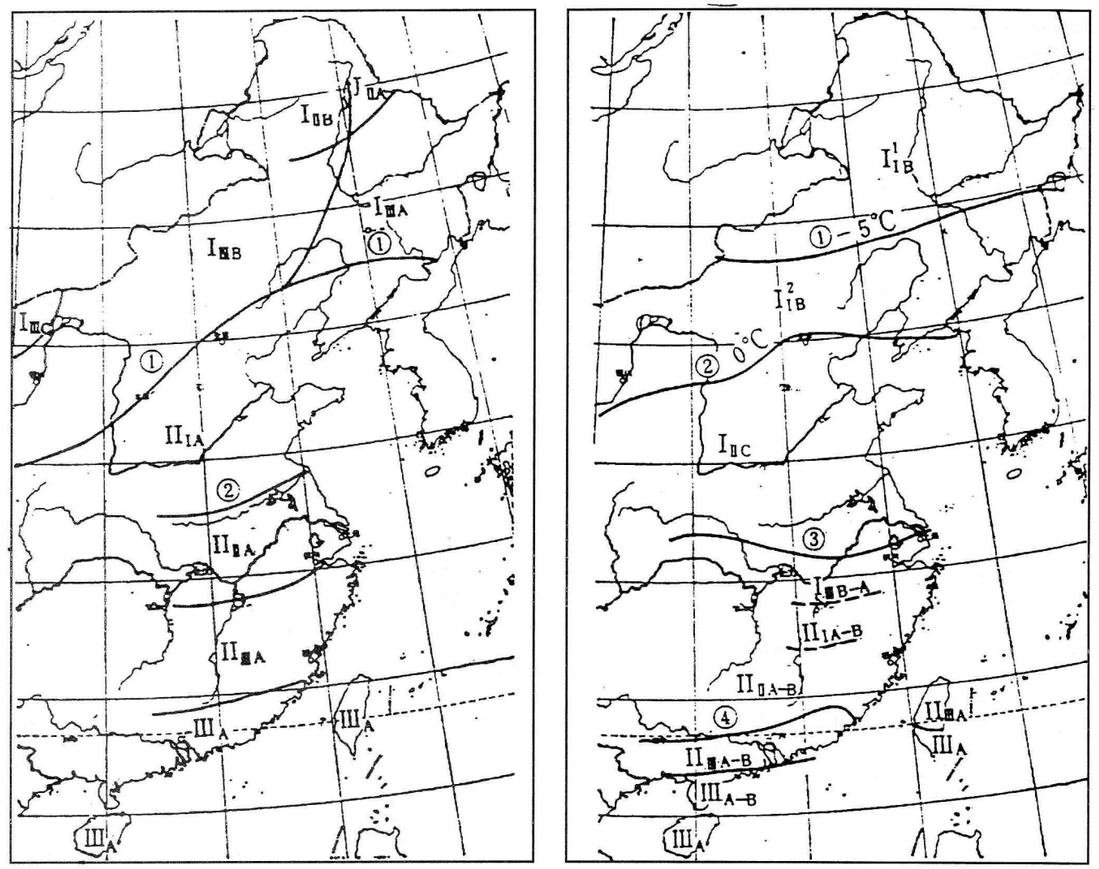
On the other hand, several important human fossils were found in this region during the last two decades. These include the Hexian, Nanjing and Yuanxian hominids. The age of Nanjing *Homo erectus* is about 350 kyr, based on uranium series and ESR (Nanjing City Museum and Department of Archaeology at Peking University 1996). The new dating of Hexian reported by Huang and his colleague (1995) is about 300 kyr. When compared with these two *Homo erectus*, the archaic *Homo sapiens* of Yuanxian is older, dated to 580 kyr by ESR method (Chen *et al.* 1996). Many other faunas or radiometric dates also confirm that early man occupied this region from the late Lower Pleistocene until the end of the Pleistocene.

Environment

The Pleistocene environment is very important for understanding human adaptations in South China. There were several factors that had strong influences on palaeoenvironments. Among these were the tectonic movements, the global climatic changes, local geographic and geological conditions.

One important result of tectonic movement was the uplift of the Qinghai-Xizang Plateau in the West of South China, and Qinling Mountains in the Northwest (Li 1979, Wu *et al.* 1992). The high plateau and mountains created high physical barriers, and isolated the region from the western part of the Old World as well as from North China. Since the Lower Pleistocene or earlier, South China gradually became an independent geographical unit (Wang 1995, 1997).

The uplift of the Qinghai-Xizang Plateau also changed the global climatic system and formed the regional monsoon climate (Qi 1989). Under the influence of the monsoon the precipitation of South China is higher than in other regions at the same latitude. The *Ailuropoda-Stegodon*-fauna existed in South China from the Lower Pleistocene to Upper Pleistocene, which is a fact associated with the tropical and sub-tropical forest environment (Wu, Olson 1985). The new data from multidisciplinary research also indicate that the Pleistocene environments of South China should be mainly sub-tropical or tropical climate with more forests, especially in the southern part (Shi *et al.* 1989).



a)

I_{IIA}	Wet temperate forest
I_{IIB}	Semi-wet temperate forest-grassland
I_{IIIA}	Wet warm temperate forest
I_{IIIB}	Semi-wet warm temperate forest-grassland
I_{IIIC}	Warm temperate grassland
II_{IA}	Wet northern subtropical forest
II_{IIA}	Wet middle subtropical forest
II_{IIIA}	Wet southern subtropical forest
III_A	Wet tropical forest
①	Northern bounds of tropical forest
②	Northern bounds of Wangwen-red-clay

b)

I^1_{IB}	Semi-wet northern cold temperate grassland
I^2_{IB}	Semi-wet southern cold temperate grassland
I_{IIC}	Semi-dry temperate grassland
I_{IIIB-A}	Semi-wet to wet warm temperate forest-grassland to forest
II_{IA-B}	Wet to semi-wet northern subtropical forest to forest-grassland
II_{IIA-B}	Wet to semi-wet middle subtropical forest to forest-grassland
II_{IIIA-B}	Wet to semi-wet southern subtropical forest to forest-grassland
IIIA	Wet tropical forest
III_{A-B}	Wet to semi-wet tropical forest to forest-grassland
①	Annual average temperature line (–5 °C)
②	Annual average temperature line (0 °C)
③	Loess southern bounds
④	Red-soil northern bounds

FIGURE 2. a – Middle Pleistocene environment of East China in the warmest period (from Huang *et al.* 1987); b – Upper Pleistocene environment of East China (18–15 kyr BP) (from Huang *et al.* 1987).

Even though climate was mainly warm and wet, the influences of global climatic cooling were nevertheless recorded in the Quaternary sediment of South China, most clearly in the northern part. As mentioned above, the multidisciplinary research on the Xiangyang site has provided not only the chronological framework but also records of climatic changes in South China from the late Lower Pleistocene to the early Upper Pleistocene (see

Figure 1). The Xiangyang stratigraphic section has nine cycles of loess and palaeo-soil, which can be compared with the Luochuan Section, the typical loess statigraphic section in Northwest China (Fang *et al.* 1992, Zhao, Yang 1995). During the glacial period, the climate became dry and cold, the temperate grassland moved more to the South and covered a large area in the North of Nanling Mountains *(Figure 2b)*. In the interglacial phases, the tropical and sub-tropical forests moved toward the north and occupied all South China, while sometimes spreading even further north *(Figure 2a)* (Huang *et al.* 1987).

The variation of geological and geographical conditions also contributed to the local environments. There were more plentiful rocks for raw materials in the mountain areas, while pebbles were the only resource of stone in the river valley or basin areas. Vegetation also was different between the highland-mountain areas and the valley of rivers or margin of lakes. All of those factors combined together to form many distinctive regional environments in South China during the long period of Pleistocene. Those were the backgrounds of human evolution in this part of the Old World.

ARCHAEOLOGICAL RECORDS

The Southeast

Almost all of the new discoveries of Palaeolithic archaeology made in South China during the last two decades come from this region. They include several hundred lithic localities as well as several important hominid fossils such as Hexian, Yunxian and Nanjing. The lithic localities are mainly distributed along river banks and concentrated on the valley plains of different rivers, especially in the Hanshui Valley, the valleys of the middle and lower reaches of Changjiang River, the Yuanshui River Valley as well as the Youjiang River Valley. Only a few cave sites are located in this region, most of them dated to the late Upper Pleistocene.

The Hanshui Valley

The Hanshui Valley crosses the mountains of Southern Shaanxi and Northwestern Hubei. It consists of several basins, including the Hanzhong, the Ankang and the Yunxian. Many pebble tools were found in the high terrace of the Hanshui River. The most important discovery of this region is the Yunxian human fossils and associated lithic assemblage in the Yunxian Basin (Li *et al.* 1991, 1994, Etler, Li 1994). But more Palaeolithic localities have been reported from the Hanzhong Basin (Tang *et al.* 1987, Huang, Qi 1987). There were also several cave sites found in this area (Huang *et al.* 1987, Wang *et al.* 1988).

The earliest occupation of this area was probably during the late Lower Pleistocene. Only a few isolated teeth attributed to *Homo erectus* were collected from several caves (Wu, Olson 1985). The Yunxian skull with more archaic *Homo sapiens* features is dated to 580 kyr. Geological research also puts it in the Middle Pleistocene (Huang, Li 1995). The animal fossils associated with the human skulls are mainly the species of the *Ailuropoda-Stegodon*-faunas, and indicate a warm forest environment. One human skull was found together with animal fossils and some stone artifacts in the excavation. Unfortunately, there is little information about human behaviour preserved in this locality because of the fluvial winnowing.

Ten more lithic localities have been found in the Hanzhong Basin (Tang *et al.* 1987, Huang 1987). At most of them only a few stone artifacts were found, but by contrast thousands have been discovered in Longgang site. This site is located in the third terrace of the Hanshui river. It has the same stratigraphy as Yunxian and should be of the same age (Shen 1956, Huang 1991).

The Longgang site lies on the ancient river bank, which was near the resources of water and lithic raw material. Quartz and quartzite pebbles were knapped into tools at the site. The principal fabrication technique was direct percussion with a hard hammer. Lithic inventories include debris, cores, scrapers, choppers, picks, proto-handaxes and spheroids *(Figure 3)*. The spheroid is the major tool in the assemblage of Hanzhong Basin. The high concentration of artifacts indicates that this site was occupied for a long time.

Unlike the Middle Pleistocene, during the Upper Pleistocene people in this area preferred to live in cave sites (Huang *et al.* 1987, Wang 1991). Two cave sites have been excavated and both of them are dated to the late Upper Pleistocene. Faunas from the two caves indicate a cold, grassland environment. Many stone artifacts, fragments of animal bones as well as charcoal were found. The same percussion technique using a hard hammer as in the earlier periods was still used to work the quartz and quartzite pebbles in the nearby river banks. But the lithic industries are different from those of the Middle Pleistocene. They are dominated by small flake tools such as side scrapers and small points. Many of the flake tools are carefully retouched *(Figure 4)*.

There are also some open air sites of the Upper Pleistocene found in this region (Hubei Provincial Museum 1987). The open air sites and cave sites have different distributions. The distance between sites is greater than is the case earlier, while more cultural remains have been found in each site. This difference may be related to a change of subsistence between the Middle and Upper Pleistocene. Middle Pleistocene humans seem to depend more on pebble tools for foraging in the woodlands near the river banks, while late Upper Pleistocene humans with small flake tools lived in the grassland and probably hunted more frequently.

The Valley of the middle reach of the Changjiang River

The Valley of the middle reach of the Changjiang River is the central region of the Southeast where hundreds of lithic localities are distributed over the different terraces of the Changjiang river and its tributaries. Because of the

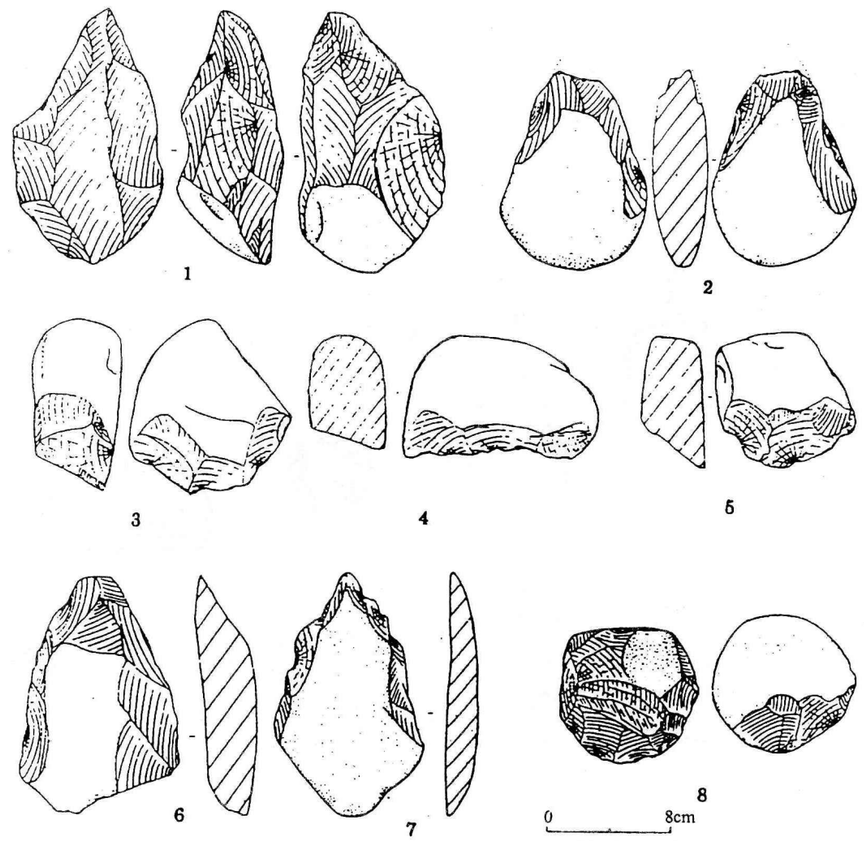


FIGURE 3. Artifacts from Longgang (from Shaanxi Provincial Institute of Archaeology 1985).

chemical condition of the sediment there are no human or animal fossils found with the lithic remains. The relative chronology was established by Quaternary studies. The reticulate-red-clay of the sediment of high terraces was formed under a warmer and wetter environment in the Middle Pleistocene and earlier. The Xiashu loess of the lower terrace was deposited in relative cool and dry condition during the Upper Pleistocene, especially the upper part of Xiashu loess, which was formed in a more cool and dry environment during the last glacial (Yang *et al.* 1962, Ding *et al.* 1987, Yuan 1992).

Most of the Palaeolithic remains are found in the reticulate-red-clay situated in the high terraces. The distribution of sites is similar to the Hanzhong Basin, but more concentrated. Several sites have been excavated in this region. Those are distinctive in the density of artifacts as well as in their horizontal structure. The excavation of the Dashengmiao site found only twenty artifacts in 28 square meters (Hunan Provincial institute of Archaeology 1989). However there were ten thousands artifacts and manuports in the Jigongshan site. The former was a

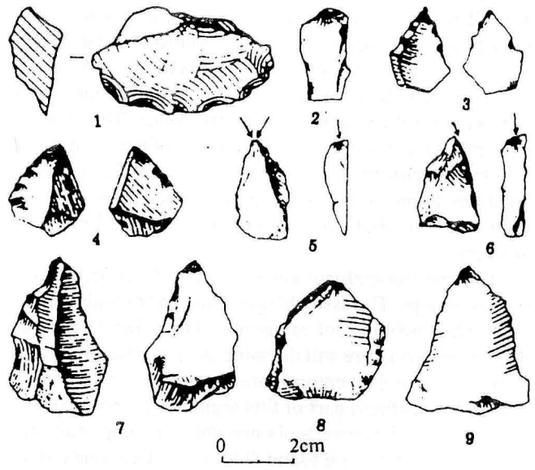


FIGURE 4. Artifacts from Xiaokongshan (from Wang, Yang 1988).

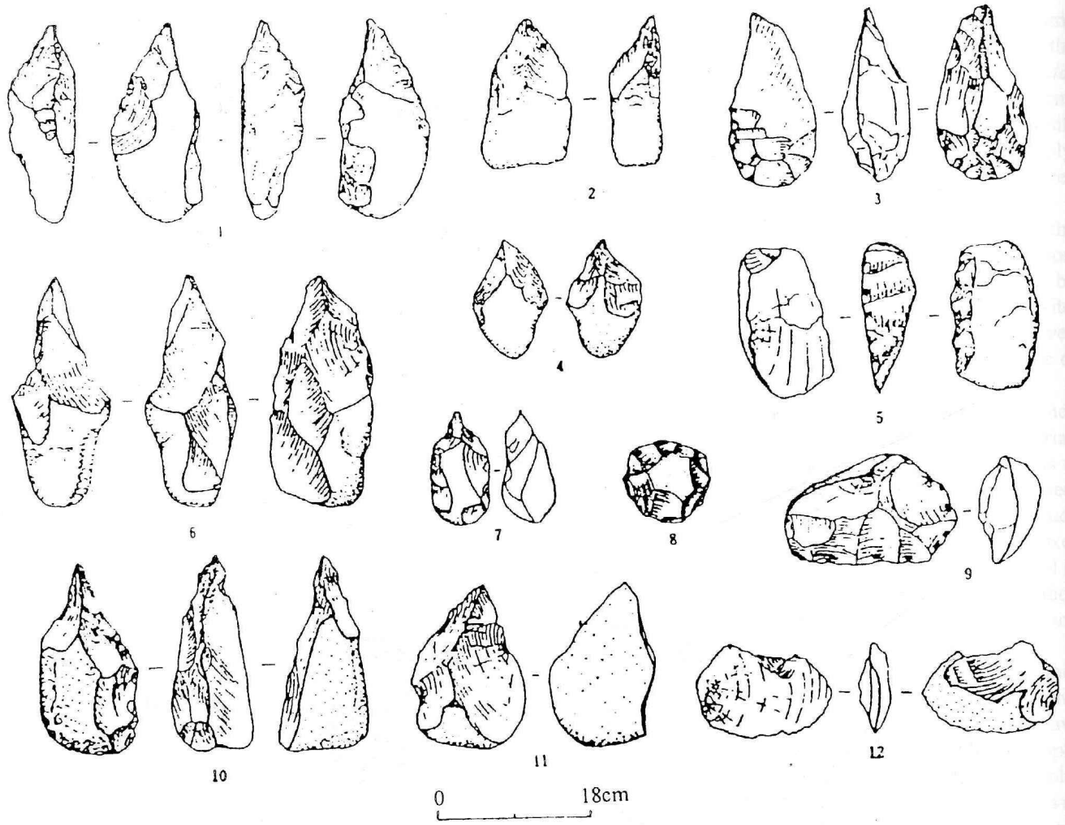


FIGURE 5. Artifacts from Lishui Valley (from Yuan 1992).

temporary site which was occasionally visited by early man. The latter clearly was a main site and had been occupied for a relatively long period (Wang 1997). According to the archaeological excavations and surveys in this region there are more temporary sites with small numbers of artifacts and only a few main sites. The main site is usually located in the center of a group of temporary sites.

On the contrary, there are only few Palaeolithic localities found in the upper part of Xiashu loess of the lower terrace, but all of them have yielded plentiful artifacts.

The lithic assemblages are also very different between the two groups. The assemblages found in the high terraces are typical pebble tool industries. The lithic techniques and raw materials are still the same as in the Hanshui Basin, but the stone tool inventories are distinctive. The dominant type in the northern part of this region is the pointed tool. Choppers or chopping tools are not very important and only few spheroids are found *(Figure 5)*. The forms of the pointed tool or pick varies among sites, but the basic raw material and technique are the same. The pointed tools found in Jigongshan site are of almost the same size, 16 to 18 cm in length and 6 to 8 cm in width. Long pebbles were selected as the raw material, split along the long side to produce blanks. The point was retouched on one end of the blank and seem to have a special function in this region (Yuan 1992, Wang 1997).

No similar pointed tools were found in the Yuanshui Valley, the southern part of this region. A few thick pebble artifacts with a short edge are the only pointed tools. The side-choppers and end-choppers are most common and account for about 80 % of the tools. Most of those choppers are made on long, round or oblate pebbles with a fine worked edge *(Figure 6)*.

The lithic assemblage of the lower terrace is dominated by flake tools. Local pebbles were still the source of stone tool raw materials, while some flint or chert was obviously transported from far away. The direct percussion technique continued to applying to both core reduction and retouching (Yuan 1992, Wang 1997). Lithic inventories include side scrapers and small points and both of them were made on small flake blanks with fine retouching.

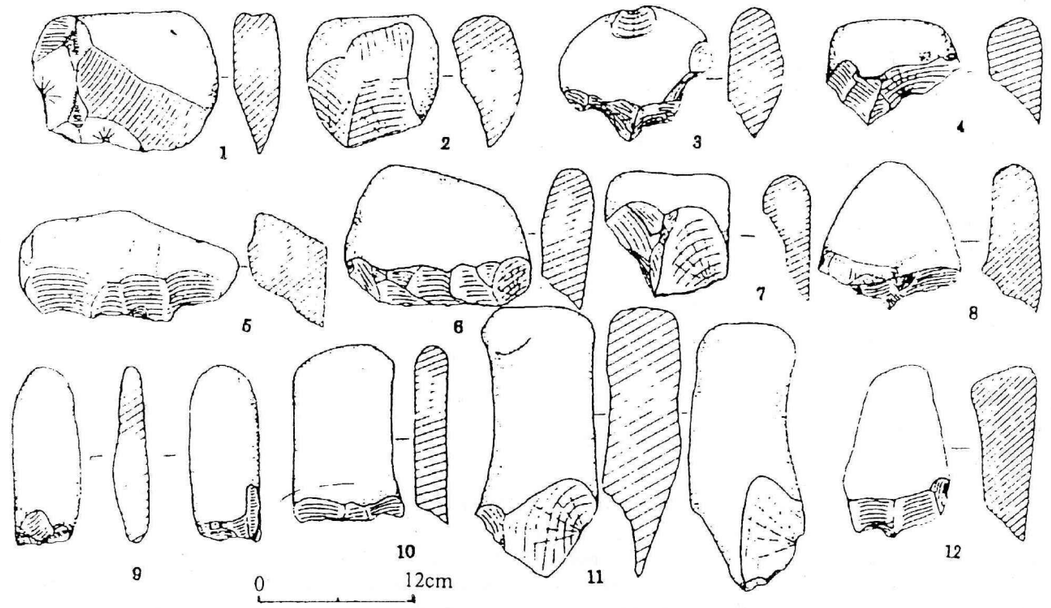


FIGURE 6. Artifacts from Huaihua (from Huaihua District cultural relics work group 1993).

The Zhujiang River Valley

The Zhujiang River valley lies in the southern part of Southeast China. It is a rather mountainous region. The climate is warmer, and changed from tropical to subtropical during the Pleistocene. Compared with the North region, there are more cave sites in this area and most of them dated to the Upper Pleistocene. The open air sites are similar to the North in both the age and distribution.

A larger number of open air localities have been found in the Baise Basin of the Youjiang River, a tributary of the upper reach of the Zhujiang River. The lithic assemblage consists of pebble tools, but the inventory is different from the North. Pointed tools are still important artifacts, but they are of a different shape. Most of them were worked into a U-shape point, which seems to have had a special function. Many pointed tools are bifaces similar to Acheulian handaxes (Huang 1987, 1991, 1993). There are many choppers too but no spheroids are found in this area.

When re-examining the sediment yielding the Maba archaic *Homo sapiens* skull, two pebble tools were found (Song *et al.* 1988). Pebble tools are also associated with the modern human fossil in Baojiyan, a cave site in Guilin, Guangxi (Wang *et al.* 1982). Some flake tools appeared in this area by the late Upper Pleistocene. The early flake tool assemblages in Bailiandong consist of side scrapers, points and other small tools. These are made on flint or chert and are retouched carefully. However, the later remains from this cave site are dominated once again by pebble tools (Zhou 1994).

The Southwest

The Palaeolithic remains of the Southwest have been found in both the Yunnan-Guizhou Plateau and the Sichuan Basin. The features of stone tool industries and settlement patterns differ considerably between the two regions.

The Yunnan-Guizhou Plateau

The earliest occupation of this plateau – mountainous region is found in Yuanmou, Yunnan, and includes two teeth of *Homo erectus* and several stone artifacts dated to the Lower Pleistocene or Middle Pleistocene (Liu, Ding 1983, Qian 1985). More evidence of early man's adaptation in this area come from a number of cave sites.

Among the cave sites, the Guanyindong in Qianxi County, Guizhou Province, is one of the earliest. It has plentiful cultural remains, both stone artifacts and animal bone fossils. The site is located in a corner of a small Karst basin, surrounded by limestone hills. The main excavated area is the western entrance, where the sediment is about 4 meters thick and includes 7 cultural layers dating from 190 kyr to 40 kyr (Yuan *et al.* 1986, Shen, Jin 1992). Even though early man visited this cave many times and occupied it for a long time, the lithic assemblages are the same from the lowest layer to the top. Lithic raw materials came from nearby, within 2 km of the site, and include siliceous limestone, vein rock and chert etc. The principal means of reducing nuclei and retouching tools was simple direct percussion with a hard hammer. The lithic inventories include side scrapers, end scrapers, points and choppers.

Most of the implements are less than 50 mm and are made on flakes. Only a few choppers made on pebbles have been found (Li, Wen 1986).

Even though some artifacts could have been refitted *in situ*, the high proportion of implements among the stone artifacts found in different layers shows that most of the implements were made in another place and brought into the cave. A large number of animal bone fragments associated with the artifacts indicate that the Pleistocene residents of this cave were hunters of big-animals. The dominant species at this site are *Bubalus, Stegodon* and *Rhinoceros*. A hundred and more *Bubalus*, and about fifty *Rhinoceros* were identified from the excavation. The age groups of both species are close to extant age groups. However, most of the hundred and more identified *Stegodon* were young animals (Li, Wen 1986). The difference might be related to different hunting strategies for different animals (Klein 1989).

Hunting activities are more clearly understood during the late Upper Pleistocene. An example of that period comes from Longtanshan Cave site, in Chenggong, Yunnan Province. Even though this site was damaged before excavation there are still many stone artifacts, ashes and fragments of animal bone found in the remaining sections. Most of the tools are finely retouched side scrapers made on flakes. Represented animal species are mainly herbivores such as *Bubalus* and *Cervus*.

The animal fossils associated with the lithics are mainly species of the *Ailuropoda-Stegodon*-fauna, which indicate a warm climate, but many of them lived in open grassland.

The Sichuan Basin

There are only a few open air sites found in the central part of the basin and all of them date to the late Upper Pleistocene. Recently, along the valley of Changjiang River in the Three Gorges area some pebble tool assemblages have been reported. They probably come from the deposits of the early Upper Pleistocene. Even though the Longgupo fossil and artifacts are very close to the basin, and maybe as early as 1.7 to 1.9 myr., no human remains of the Lower or Middle Pleistocene have been found in the basin.

The lithic assemblages of the central part of the basin are similar to the pebble tool industries of the Southeast. Both the distribution of sites and features of the stone artifacts are similar. All of the discoveries came from the sediments of ancient rivers or lakes indicating that the Pleistocene residents of this area lived in the same environment as the Southeast. The raw materials of the stone tools are pebbles obtained near the sites. The implements include choppers and scrapers. The choppers are still dominant tools but the numbers of the scrapers made on flakes are clearly increasing in the younger sites (Li 1992, Li, Zhang 1981, 1984). The studies of pollen and fauna indicate that subtropical forests or forest-grasslands environments were associated with those pebble tool industries (Zhang *et al.* 1982).

However, there is a small flake industry found in the western margin of the basin at the Fulin site. This is located in a mountainous basin at an elevation of 790 m above sea level. The cultural remains were excavated from the ancient river bank, including stone artifacts, ashes and fragments of animal bones (Zhang 1977). By contrast to the pebble tool industries in the basin, the lithic raw materials are almost of flint nodules from the surface of weathered rock exposures near the site. The lithic inventories consist of side scrapers, end scrapers and small points, small in size, averaging 26.1 mm in length and 19.2 mm in width. Only a few species of animals were found, including *Ursus thibetanus, Sus* sp. indet., *Rusa* sp. indet. and *Muntiacus* sp. indet. According to the biostratigraphic data, the site was probably occupied by hunters at the last glacial maximum. Comparison with the local modern ecological conditions suggests that the residents of Fulin site lived in a mountainous grassland environment.

DISCUSSION

According to this brief examination of archaeological records of South China, we can see that the Pleistocene human adaptations varied through time and space: The pebble tool industries mainly occupied the ancient river banks or lake margins in the plain areas. The flake or small flake tool industries were distributed over the mountain and plateau region in the early period, and later also in the lowland areas.

The earliest pebble tool industries occupied this region during the late Lower Pleistocene, and lasted until the early Upper Pleistocene, in some places even later. The regional Quaternary geology research has provided a general environmental background for this region. There were mainly tropical or sub-tropical climates during most of the Pleistocene in South China. The northern part was sometimes influenced by temperate climate. Under the conditions of warm and wet climate influenced by the monsoon, forest was the major vegetation in the Southeast, especially in the river or lake regions. The combination of woodland vegetation and plentiful pebbles for raw materials in ancient river banks and lake margins attracted early hominids over a long time span. The distribution of the lithic localities reflected the land use of the early residents of this region. A group of sites in a river valley probably represented the territory of a group of Pleistocene hominids. A site such as Jigongshan with a large number of stone artifacts should have been a main site with the multi-functions of tool making, food processing and so on. Around the main site, more localities with only a few artifacts indicate temporary activities. When compared with the earliest occupations of the western part of the Old World there seem to be no differences of the land use between the early hominids of South China and the West. In both regions early hominids concentrated their subsistence activities along the river banks and around lake margins (Leakey 1971, Bar-Yosef, Goren-Inbar 1993).

The flake or small flake tool industries were the first in the mountain or plateau region of the Southwest. There were plentiful natural caves, a variety of lithic raw materials and open environments with more grassland vegetation. In the Southeast, flake tool industries replaced pebble tools in the late Upper Pleistocene when the temperate grassland arrived in this area during the last glacial period.

The site density of flake tool industries is far lower than that of pebble tool. The latter are widely separated and tend to occur isolated. The distribution differs considerably from that of pebble tool industries and is probably the result of adapting to more open environments.

The different adaptations were also demonstrated by lithic assemblages. Pebble tool assemblages consist of choppers, pointed tools, spheroids and scrapers, and are dominated by heavy-duty tools. Those tools were more efficient for working in forest areas. On the contrary, flake tool assemblages are dominated by light-duty tools, such as scrapers and points. The sharp edges of scrapers that were made on flakes were more convenient to carry and process the game during hunting or scavenging in the grassland areas.

The new developments of archaeology and related disciplines have provided more information about human adaptations and Pleistocene environments in South China. Global climate changes and local geological and geographical conditions created many distinctive regional environments, and the uplift of the Xizang-Qinghai Plateau isolated this region from the Western part of the Old World. When hominids migrated to this region, they had to adapt to the special environment (Gamble 1993). The pebble tool industries lasted such a long time that they were obviously related to tropical or sub-tropical forest environments, while the flake tool industries were the results of adapting to more open grassland environments. Local lithic raw materials were also an important reason leading to the development of two distinctive stone tool industries. In the valleys of rivers or margins of lakes in the lowland areas, pebbles were the only resources for stone tool making, and here the pebble tool industries could therefore exist such a long time. The mountain or karst highland regions had more stone tool raw materials, but generally speaking, South China lacked high quality lithic raw materials such as flint, which could be one of the factors that resulted in irregular flake tools dominating this region. On the other hand, the Xizang-Qinghai Plateau blocked cultural exchange between the East and West. This is probably another reason why few Acheulian, and no Levallois and Blade techniques have been found in South China.

Even though distinctive Palaeolithic cultures existed east and west of the Movius Line (Clark 1994, Lin 1996, Schick, Dong 1993), there are still many common features in the adaptation among the Pleistocene hominids including land use and subsistence strategy. Contrary to the simple pebble tool and flake tool technology, the lithic assemblages varied through time and space, with scrapers, choppers, pointed tools and even spheroids dominating in different lithic assemblages. This indicates that lithics were still the basic tool for Pleistocene hominids in the Far East. Forest environments could provide more plant food in the tropical and subtropical region, but at least big game hunting or scavenging activities existed in Southwest China too. These new discoveries of the Palaeolithic in South China seem to be more complex than can be explained by the bamboo hypothesis.

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